

Serial No. 10/692,483
Amdt. dated Sept. 28, 2007
Reply to Office action of July 11, 2007

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) A random number generation apparatus which produces a random number sequence for which an appearance balance of 1/0 has an equal probability, comprising:

a random noise generator arranged to receive physical noise at an input and to generate random noise in response ~~generation means for generating random noise by measuring physical noise;~~

at least one random pulse wave generator arranged to receive said random noise at an input, waveshape said random noise, and to generate a random pulse wave in response ~~generation means for generating a random pulse wave by waveshaping the random noise;~~

a binary pulse sequence converter arranged to receive said random pulse wave at an input, to sample ~~conversion means for sampling~~ the random pulse wave with a first clock of a constant period and to converting it into a binary pulse sequence of a constant period, which has on/off of the sampled values as a pulse code; and

a binary pulse sequence code smoothing circuit arranged to receive said binary pulse sequence at an input, to un-reverse and reverse ~~means for un-reversing and reversing~~ the polarity of the binary pulse sequence every half period of a second clock which is synchronous with and has a frequency which is related to one-half that of said first clock by a division ratio, and to provide the un-reversed and reversed binary pulse sequence at an output, said

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output being a random number sequence,

~~wherein a random number sequence of the smoothed binary pulse sequence code is generated,~~ said un-reversing and reversing polarity ensuring that said random number sequence has an appearance balance of 1/0 with an equal probability.

2. (previously presented) The random number generation apparatus according to claim 1, wherein the random pulse wave is generated so that the generation interval of the random noise defines the on/off time of each pulse.

3. (currently amended) The random number generation apparatus according to claim 1, wherein the outputs of a plurality of said random noise generators ~~generation means~~ are inputted to the random pulse wave generator ~~generation means~~ such that the on/off occurrence frequency of the random pulse wave is increased.

4. (currently amended) The random number generation apparatus according to claim 1, wherein the at least one random pulse wave generator ~~generation means~~ comprises pulse generation means which receives said random noise at an input, said pulse generation means arranged such that its output state changes for every occurrence of random noise received at said input.

5. (currently amended) The random number generation apparatus according to claim 1, wherein the binary pulse sequence code smoothing circuit ~~means~~ comprises a divider which divides the frequency of said first clock by half to generate said second clock, and an XOR gate which receives said binary pulse sequence

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and said second clock at respective inputs and provides said smoothed binary pulse sequence at its output.

6. (currently amended) The random number generation apparatus according to claim 1, wherein the binary pulse sequence code smoothing circuit ~~means~~ comprises a divider which divides the frequency of said first clock by half to generate said second clock, and a logic circuit which reverses the binary pulse sequence synchronously with said second clock to un-reverse and reverse the polarity of the binary pulse sequence every half period of said second clock.

7. (new) The random number generation apparatus according to claim 1, wherein the frequency of said second clock is one-half that of said first clock.